

64,600-093; ERSO 900056  
Serial Number 10/038,994

### REMARKS

Favorable reconsideration of this application in light of the above amendments and the following remarks is respectfully requested.

Claims 1-2, 4-6 and 8-20 are pending in this application. Claims 1-8 have been elected for prosecution. Claims 9-18 are withdrawn. Claims 3 and 7 are canceled herein. Claims 19-20 are newly added. No claims are amended herein. No claims have been allowed.

#### *Improper Final Rejection*

Applicant notes that the Examiner within the advisory action mailed 30 March 2004 denied entry of applicant's amendment filed 17 March 2004 incident to new issues and new matter considerations.

Under such circumstances, a first office action final rejection is apparently improper since applicant's claims could not have been finally rejected on both the grounds and art of record in the next office action (i.e., the alleged new issues and new matter for which amendment entry was denied provide new grounds for rejection for which applicant has not been provided a fair opportunity for response, even if the art of record is unchanged). "If an amendment was refused entry in the parent case on the grounds that it raised new issues or new matter, [Action is Final, First Action] form paragraph cannot be used." MPEP 706.07(b), Examiner Note 2 (explicit with respect to continuation or substitute applications, but not specifically excluded with respect to RCE applications).

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Applicant respectfully requests a non-final office action to which applicant may fully and properly respond, if the following responses do not place applicant's application in condition for allowance.

***Amendment Objection and Claim Rejections – 35 U.S.C. § 112***

The Examiner has objected to applicant's amendment filed 17 March 2004 (and entered as an RCE submission) under 35 U.S.C. § 132 as introducing new matter into applicant's disclosure.

The Examiner has rejected claims 1-8 under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in applicant's specification in such as way as to reasonably convey to one skilled in the relevant art that applicant, at the time applicant's application was filed, had possession of applicant's claimed invention.

With respect to the foregoing objection and rejection, that Examiner asserts that neither applicant's Fig. 1 nor applicant's specification as originally filed "require[s] a strictly oblique flow of fluid into [applicant's] aperture." Further with respect to applicant's Fig. 1, the Examiner asserts that "such figures substantially are schematics and do not provide lack of other than oblique flow." Further with respect to applicant's specification, the Examiner cites applicant's pages 13-14 and in particular paragraph 0037 and asserts that the same "suggest that a plurality of relationships of channel terminal portions to apertures may optionally exist in embodiments [of applicant's invention]." Applicant assumes that the Examiner derives the Examiner's foregoing assertion from the portion of applicant's paragraph 0037 which discloses that "at least a pair of reagent supply channels is properly terminally disposed with respect to the

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aperture such as to effect a swirling mixing of at least a pair of reagents introduced into the aperture, in accord with the present invention.”

In response in a first instance, applicant respectfully challenges the Examiner's comments that applicant's Fig. 1 is substantially a schematic and that it apparently does not prove lack of other than oblique flow. First, applicant is unable to discern how the mere fact that applicant's Fig. 1 is a schematic diagram necessarily impedes what applicant's Fig. 1 fairly discloses. Thus, applicant is unable to discern the relevance of schematic or non-schematic character of applicant's Fig. 1 as a basis for the Examiner's amendment objection or claim rejections. Second, applicant is not aware that applicant's Fig. 1 is required to disclose lack of other than oblique flow, but rather applicant asserts that applicant's Fig. 1 is required to disclose presence of only oblique flow, since the presence of only oblique flow is what applicant has claimed within independent claim 1 and independent claim 5. The lack of other than oblique flow may plausibly inherently or implicitly derive from the presence of only oblique flow. Applicant's Fig. 1 clearly shows only oblique flow since each of applicant's reagent supply channels 13a and 13b is disposed properly obliquely with respect to applicant's aperture 11 such as to provide applicant's claimed swirling mixing.

“The drawing in a nonprovisional application must show every feature of the invention specified in the claims.” MPEP 608.02(d), 37 C.F.R. 1.83(a). Applicant's Fig. 1 clearly shows: (1) each of at least two reagent supply channels only obliquely disposed with respect to applicant's aperture; and (2) a resulting swirling mixing of reagents introduced into applicant's aperture therefrom, in accord with applicant's claim 1 and claim 5. Again, in accord with the above citation, applicant believes that applicant's drawing must show every feature of applicant's claimed invention, which in part includes only oblique flow into applicant's aperture

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from each of applicant's reagent supply channels. Applicant does not believe that applicant's drawing is required to show absence of other than oblique flow, as suggested by the Examiner.

In response in a second instance, applicant appreciates the Examiner's reference to applicant's paragraph 0037. Again, applicant assumes that the Examiner might have intended to cite applicant's disclosure therein that "at least a pair of [applicant's] reagent supply channels is properly terminally disposed with respect to the aperture such as to effect a swirling mixing of at least a pair of reagents introduced into the aperture" as evidence that applicant did not intend to "require a strictly oblique flow of fluid into [applicant's] aperture."

However, applicant asserts that applicant's paragraph 0037 to be properly understood must be read within the context of applicant's paragraph 0038. Applicant's paragraph 0038 further describes applicant's microfluidic mixing apparatus within the context of applicant's schematic plan-view diagram of Fig. 1. Paragraph 0038 discloses that "each of the pair of reagent supply channels 13a and 13b terminates at the aperture with a tangential, oblique and acute angle of incidence of from about 20 to about 80 degrees." Applicant asserts that the foregoing disclosure provides adequate support for applicant's assertion that applicant has considered a microfluidic mixing apparatus having reagent supply channels only obliquely aligned with respect to a mixing aperture. Applicant further notes that within applicant's specification and drawings applicant has exclusively disclosed a microfluidic mixing apparatus with only oblique reagent supply channels. Applicant in paragraph 0038 acknowledges a microfluidic mixing apparatus with greater than two reagent supply channels. Implicitly, these reagent supply channels are analogous to reagent supply channels 13a and 13b since they are not otherwise described. Nowhere within applicant's disclosure does applicant explicitly, implicitly

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or inherently disclose applicant's reagent supply channels as other than oblique with respect to applicant's aperture.

Thus: (1) applicant believes that applicant's Fig. 1 clearly, completely and explicitly illustrates reagent supply channels terminating only obliquely with respect to an aperture within applicant's microfluidic mixing apparatus; and (2) applicant believes that applicant's paragraph 0038 further supports applicant's assertion of reagent supply channels of any number each terminating only obliquely with respect to applicant's aperture. Thus, applicant asserts that neither: (1) applicant's paragraph 0033 as amended; nor (2) applicant's claims 1 and 5 as amended, contain new matter since applicant's disclosure is limited to reagent supply channels that explicitly, implicitly or inherently terminate only obliquely with respect to applicant's aperture.

In light of the foregoing responses, applicant respectfully requests that: (1) the Examiner's objection to applicant's amendment filed 17 March 2004 and entered; and (2) the Examiner's rejections of applicant's claims 1-8 under 35 U.S.C. § 112, first paragraph, be withdrawn.

***Claim Rejections - 35 U.S.C. § 102***

The Examiner has rejected claims 1-8 under 35 U.S.C. § 102(c) as being anticipated by Vanden Bussche et al. (U.S. Patent No. 6,655,829; hereinafter "Vanden Bussche").

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At pages 4-5 of the office action made FINAL, the Examiner reads Vanden Bussche onto applicant's claims 1-8, implicitly concluding anticipation thereof by Vanden Bussche.

In response, applicant has previously amended claim 1 and amended claim 5 to incorporate therein limitations that applicant believes to provide a patentable distinction between applicant's invention as claimed therein and Vanden Bussche. In that regard, applicant has amended claim 1 and amended claim 5 to incorporate therein the limitation that each of applicant's at least two channels that terminates with respect to applicant's aperture within applicant's microfluidic mixer apparatus terminates only obliquely with respect to applicant's aperture within applicant's microfluidic mixer apparatus. Support for this limitation newly incorporated into claim 1 and claim 5 is found within applicant's specification at paragraph 0033 as amended and paragraph 0038 as unamended. They in turn find support within applicant's Fig. 1 as originally filed.

In comparison, Vanden Bussche at Figs. 1-3 teaches related microfluidic mixer apparatus where a plurality of channels terminates at an aperture 14 for mixing fluids therein. The plurality of channels terminates both obliquely (i.e., reference numerals 10) and perpendicularly (i.e. reference numerals 12) with respect to the aperture, but not only obliquely with respect to the aperture 14, as is required within applicant's invention as disclosed and claimed within claim 1 and claim 5.

Thus, since each and every element within applicant's invention as disclosed and claimed within claim 1 and claim 5 is not taught within Vanden Bussche, in particular with respect to a microfluidic mixer apparatus having at least two channels terminating at an aperture,

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where each of the at least two channels terminates only obliquely with respect to the aperture,  
applicant asserts that claim 1 and claim 5 may not properly be rejected under 35 U.S.C. § 102(e)  
as being anticipated by Vanden Bussche.

Since all remaining claims within this application are dependent upon claim 1 or claim 5 and carry all of the limitations of claim 1 or claim 5, applicant additionally asserts that those remaining claims may also not properly be rejected under 35 U.S.C. § 102(e) as being anticipated by Vanden Bussche.

In light of the foregoing response, applicant respectfully requests that the Examiner's rejections of claims 1-8 under 35 U.S.C. § 102(e) as being anticipated by Vanden Bussche be withdrawn.

#### *Other Considerations*

Applicant has newly added claims 19-20 as derived from claims 1 and 5, but which claim a mixing apparatus having only two reagent supply channels.

No additional prior art of record not employed in rejecting applicant's claims to applicant's invention has been cited. A fee is due as a result of this amendment and response. A Credit Card Payment form in the amount of \$172.00 is attached hereto. The Commissioner is hereby authorized to charge Deposit Account No. 50-0484 any additional fee(s) which may be due.



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### SUMMARY

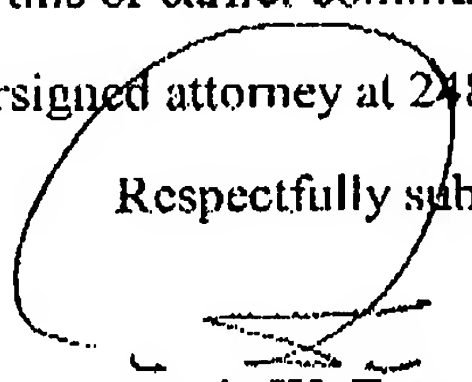
Applicant's invention as disclosed and claimed within claim 1 and claim 5 is directed towards a microfluidic mixer apparatus and a method for operating the microfluidic mixer apparatus. The microfluidic mixer apparatus comprises at least two channels which terminate at an aperture, where each of the at least two channels terminates only obliquely with respect to the aperture, such as to effect within the aperture a swirling mixing of at least two reagents introduced into the aperture through the at least two channels. Absent from the prior art of record employed in rejecting applicant's claims to applicant's invention is a teaching of each and every element within applicant's claimed invention.

### CONCLUSION

On the basis of the above amendments and remarks, reconsideration of this application, and its early allowance, are respectfully requested.

Any inquiries relating to this or earlier communications pertaining to this application may be directed to the undersigned attorney at 248-540-4040.

Respectfully submitted,

  
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